EIP 155: Intentional islanding of remote renewable networks for increased resilience in the face of climate threats

ENA Basecamp 2026

4th February 2026

Scottish & Southern Electricity Networks

TRANSMISSION

What is Intentional Islanding?

What is it?

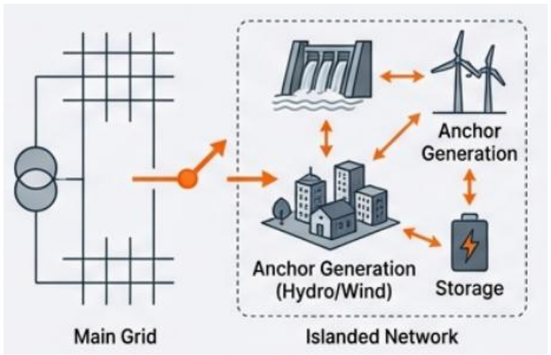
- Pre-planned, controlled separation from the transmission network
- Network Islands designed to be electrically self-sustaining for a period of time
- Activated during extreme events or restoration scenarios
- Distinct from uncontrolled system breakup

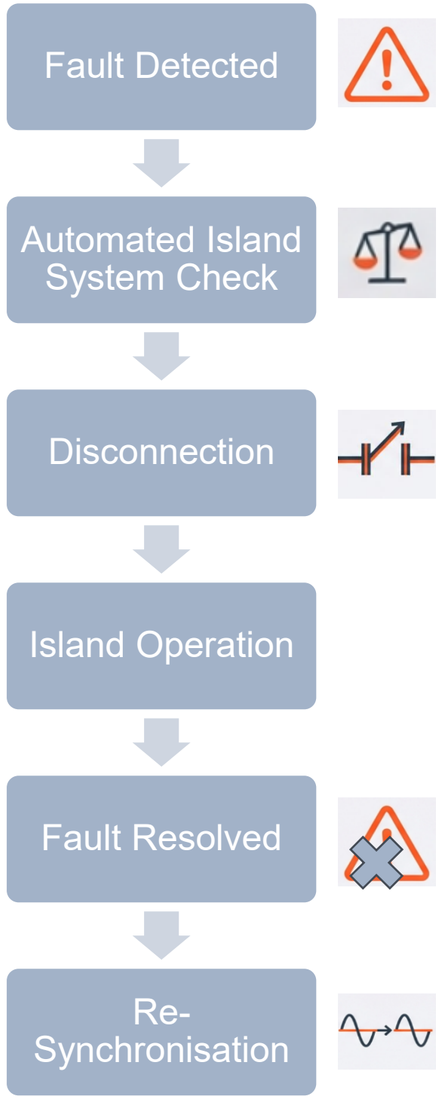
Analogy

A self-contained system like a diver's rebreather which contains all the necessary breathing apparatus in a closed loop.

Innovation Project

To model the network with intentional islanding to understand power flow behaviour and use this knowledge to feed into future network design.





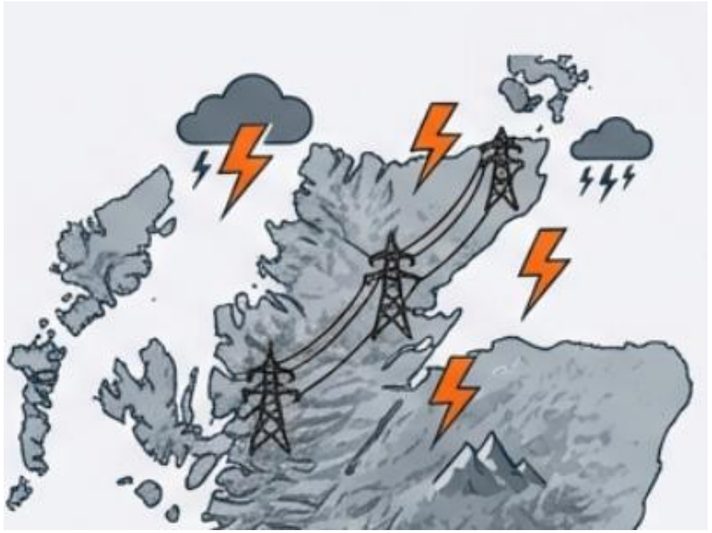
The Challenge

The Geography:
- The North of Scotland has long radial circuits, over very challenging terrain
- Long radial sections of the network are vulnerable to severe weather events
- Upgrading circuits to meet N-1 requirements can be expensive and time-intensive

The Network:
- Rapid growth in renewable generation
- Relatively small levels of flexible demand at present
- Low levels of inherent system stability and strength - particularly, when depleted

Planned Outages for Network Upgrades:
- Upgrade plans for NetZero will involve extensive network outages
- During these times, the network faces increased vulnerabilities
- Scheduling of outages within planned timelines is increasingly challenging

The Risk:
- Faults: Loss of the main link and resultant blackouts
- Curtailed Renewables: Generators are forced to trip off
- Carbon Intensive Back-up: Reliance on diesel stations to restore power

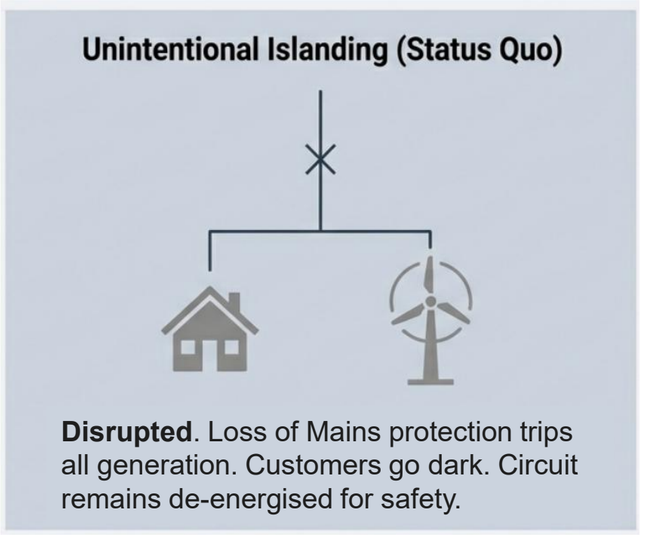


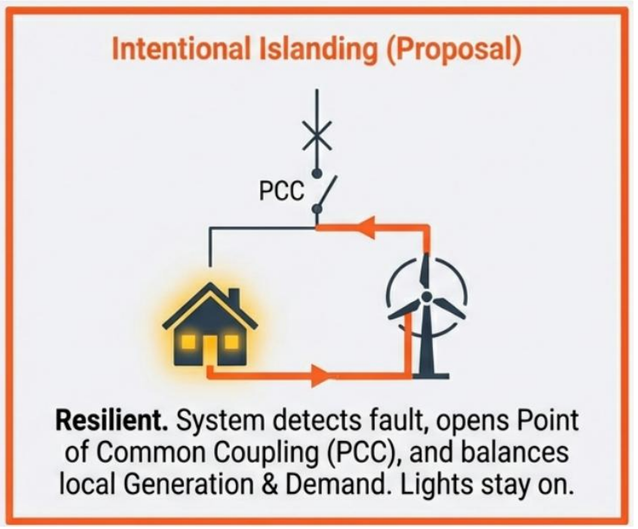
The Ambition

Resilience for Remote Communities
- Reduce risk of large-scale outages
- Faster restoration after outages
- Improve resilience to increasingly extreme weather events
- Overall improve security of supply

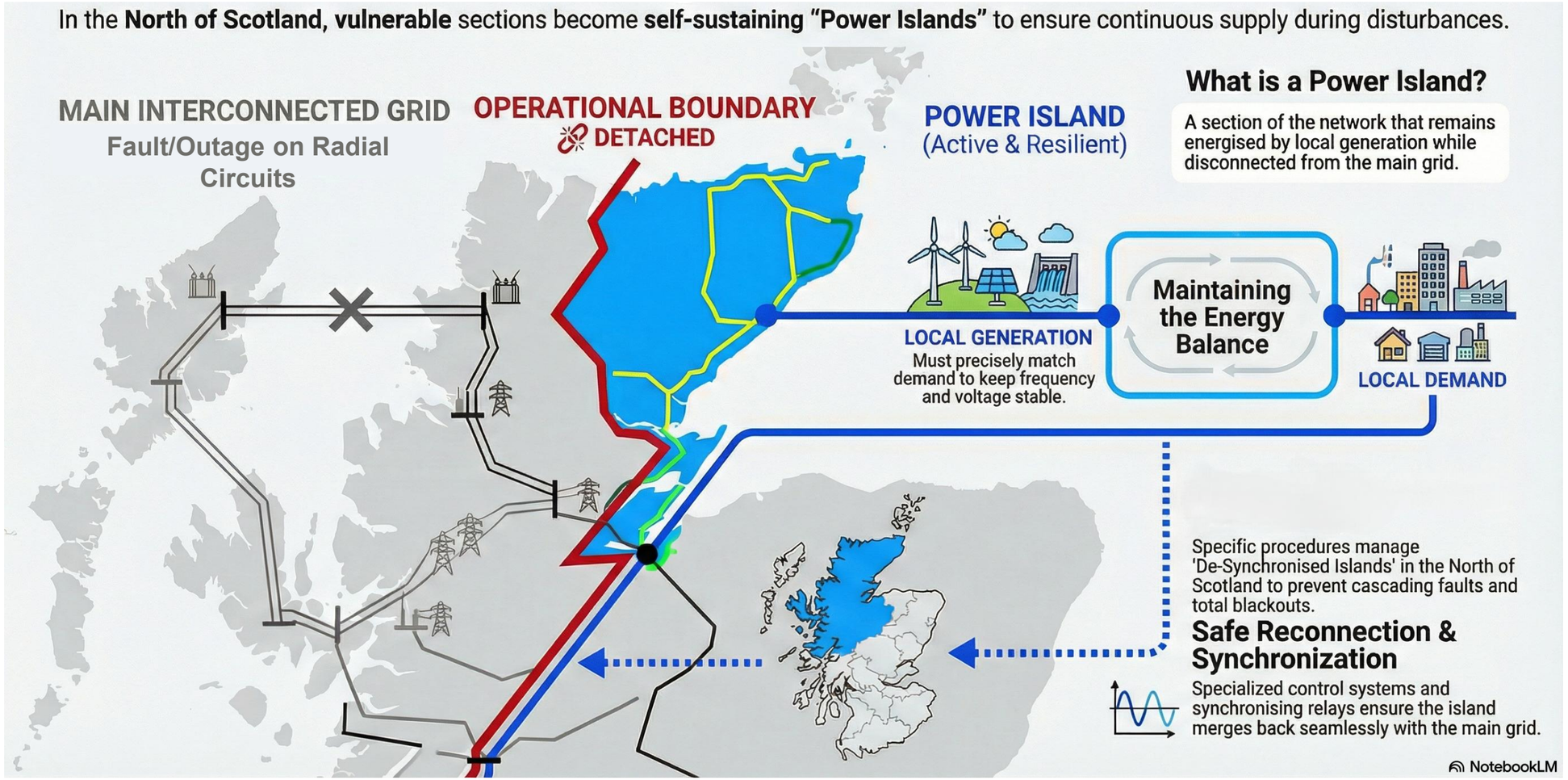
Delivering a Network for NetZero
- Reduce costly and time intensive upgrades to very remote parts of the network
- Reduce curtailment of renewable energy generation
- Reduce dependence on back-up fossil fuel generators

Flexibility and Operations
- Autonomous operation of renewable-rich regions
- More options for outage planning and extended network access periods





The Innovation: Designing for Intentional Islanding



Why is this Innovative?

- Islanding as an intentional network flexibility tool
- Limited GB evidence base for transmission islanding
- High uncertainty around stability, protection and operability of an islanded grid, especially at transmission level
- Relying on renewable energy generation and batteries as anchors
- Regulatory and commercial uncertainties

- **<u>Building-up on Previous Innovation Studies:</u>**
  - WPD Network Islanding Investigation NIA project
  - NESO & SPEN Distribution Re-Start
  - SSEN Project ReFLEX
  - SSEN Net Zero Island